IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:GAN et al

	Art Unit:
Serial No.To Be Assigned	Examiner:
Filed: March 14, 2001	Atty. Docket: CL0001165
For: ISOLATED HUMAN RAS-LIKE PROTEINS, NUCLEIC ACID MOLECULES ENCODING THESE HUMAN RAS-LIKE PROTEINS, AND USES THEREOF	

SUBMISSION OF SEQUENCE LISTING
UNDER 37 C.F.R. § 1.821(a)

Honorable Commissioner of
 Patents and Trademarks
Washington, D.C. 20231

Sir:

In compliance with 37 C.F.R. § 1.821(a), applicants submit the Sequence Listing, including the paper copy of the Sequence Listing and the computer readable copy of the Sequence Listing.

In the Specification:

The Sequence Listing is provided on pages 56-72 of the specification in the above-identified application.
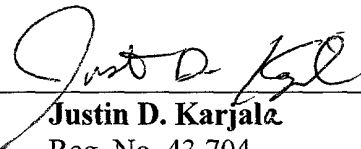
REMARKS

In accordance with 37 C.F.R. § 1.821(f), the paper copy of the Sequence Listing

and the computer readable copy of the Sequence Listing submitted herewith in the above

application are the same.

It is respectfully believed that this application complies with the Sequence Listing

requirements and is now in condition for processing.

Respectfully submitted,

CELERA GENOMICS

By:_____
　　Justin D. Karjala
　　Reg. No. 43,704

Date: _March 14, 2001_____

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Rockville, MD 20850
Tel: 240-453-3067
Fax: 240-453-3084

SEQUENCE LISTING

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<120> ISOLATED HUMAN RAS-LIKE PROTEINS,
    NUCLEIC ACID MOLECULES ENCODING THESE HUMAN RAS-LIKE
    PROTEINS, AND USES THEREOF

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            115                     120                     125
Trp Lys Arg Gln Val Thr Gln Arg Asn Pro Val Gly Gln Lys Lys Arg
            130                     135                     140
Lys Met Ser Leu Leu Phe Asp His Leu Glu Pro Met Glu Leu Ala Glu
145                     150                     155                     160
His Leu Thr Tyr Leu Glu Tyr Arg Ser Phe Cys Lys Ile Leu Phe Gln
            165                     170                     175
Asp Tyr His Ser Phe Val Thr His Gly Cys Thr Val Asp Asn Pro Val
            180                     185                     190
Leu Glu Arg Phe Ile Ser Leu Phe Asn Ser Val Ser Gln Trp Val Gln
            195                     200                     205
Leu Met Ile Leu Ser Lys Pro Thr Ala Pro Gln Arg Ala Leu Val Ile
            210                     215                     220
Thr His Phe Val His Val Ala Glu Lys Leu Leu Gln Leu Gln Asn Phe
225                     230                     235                     240
Asn Thr Leu Met Ala Val Val Gly Gly Leu Ser His Ser Ser Ile Ser
            245                     250                     255
Arg Leu Lys Glu Thr His Ser His Val Ser Pro Glu Thr Ile Lys Leu
            260                     265                     270
Trp Glu Gly Leu Thr Glu Leu Val Thr Ala Thr Gly Asn Tyr Gly Asn
            275                     280                     285
Tyr Arg Arg Arg Leu Ala Ala Cys Val Gly Phe Arg Phe Pro Ile Leu
            290                     295                     300
Gly Val His Leu Lys Asp Leu Val Ala Leu Gln Leu Ala Leu Pro Asp
305                     310                     315                     320
Trp Leu Asp Pro Ala Arg Thr Arg Leu Asn Gly Ala Lys Met Lys Gln
            325                     330                     335
Leu Phe Ser Ile Leu Glu Glu Leu Ala Met Val Thr Ser Leu Arg Pro
            340                     345                     350
Pro Val Gln Ala Asn Pro Asp Leu Leu Ser Leu Leu Thr Val Ser Leu
            355                     360                     365
Asp Gln Tyr Gln Thr Glu Asp Glu Leu Tyr Gln Leu Ser Leu Gln Arg
            370                     375                     380
Glu Pro Arg Ser Lys Ser Ser Pro Thr Ser Pro Thr Ser Cys Thr Pro
385                     390                     395                     400
Pro Pro Arg Pro Pro Val Leu Glu Glu Trp Thr Ser Ala Ala Lys Pro
            405                     410                     415
Lys Leu Asp Gln Ala Leu Val Val Glu His Ile Glu Lys Met Val Glu
            420                     425                     430
Ser Val Phe Arg Asn Phe Asp Val Asp Gly Asp Gly His Ile Ser Gln
            435                     440                     445
Glu Glu Phe Gln Ile Ile Arg Gly Asn Phe Pro Tyr Leu Ser Ala Phe
            450                     455                     460
Gly Asp Leu Asp Gln Asn Gln Asp Gly Cys Ile Ser Arg Glu Glu Met
465                     470                     475                     480
```

65

```
Val Ser Tyr Phe Leu Arg Ser Ser Ser Val Leu Gly Gly Arg Met Gly
                485                 490                 495
Phe Val His Asn Phe Gln Glu Ser Asn Ser Leu Arg Pro Val Ala Cys
            500                 505                 510
Arg His Cys Lys Ala Leu Ile Leu Gly Ile Tyr Lys Gln Gly Leu Lys
            515                 520                 525
Cys Arg Ala Cys Gly Val Asn Cys His Lys Gln Cys Lys Asp Arg Leu
        530                 535                 540
Ser Val Glu Cys Arg Arg Arg Ala Gln Ser Val Ser Leu Glu Gly Ser
545                 550                 555                 560
Ala Pro Ser Pro Ser Pro Met His Ser His His His Arg Ala Phe Ser
                565                 570                 575
Phe Ser Leu Pro Arg Pro Gly Arg Arg Gly Ser Arg Pro Pro Glu Ile
            580                 585                 590
Arg Glu Glu Glu Val Gln Thr Val Glu Asp Gly Val Phe Asp Ile His
            595                 600                 605
Leu
```

```
<210> 5
<211> 664
<212> PRT
<213> Human

<400> 5
Gly Arg Gly Thr Gln Gly Trp Pro Gly Ser Ser Glu Gln His Val Gln
1                   5                   10                  15
Glu Ala Thr Ser Ser Ala Gly Leu His Ser Gly Val Asp Glu Leu Gly
            20                  25                  30
Val Arg Ser Glu Pro Gly Gly Arg Leu Pro Glu Arg Ser Leu Gly Pro
        35                  40                  45
Ala His Pro Ala Pro Ala Ala Met Ala Gly Thr Leu Asp Leu Asp Lys
        50                  55                  60
Gly Cys Thr Val Glu Glu Leu Leu Arg Gly Cys Ile Glu Ala Phe Asp
65                  70                  75                  80
Asp Ser Gly Lys Val Arg Asp Pro Gln Leu Val Arg Met Phe Leu Met
                85                  90                  95
Met His Pro Trp Tyr Ile Pro Ser Ser Gln Leu Ala Ala Lys Leu Leu
            100                 105                 110
His Ile Tyr Gln Gln Ser Arg Lys Asp Asn Ser Asn Ser Leu Gln Val
            115                 120                 125
Lys Thr Cys His Leu Val Arg Tyr Trp Ile Ser Ala Phe Pro Ala Glu
        130                 135                 140
Phe Asp Leu Asn Pro Glu Leu Ala Glu Gln Ile Lys Glu Leu Lys Ala
145                 150                 155                 160
Leu Leu Asp Gln Glu Gly Asn Arg Arg His Ser Ser Leu Ile Asp Ile
                165                 170                 175
Asp Ser Val Pro Thr Tyr Lys Trp Lys Arg Gln Val Thr Gln Arg Asn
            180                 185                 190
Pro Val Gly Gln Lys Lys Arg Lys Met Ser Leu Leu Phe Asp His Leu
            195                 200                 205
Glu Pro Met Glu Leu Ala Glu His Leu Thr Tyr Leu Glu Tyr Arg Ser
        210                 215                 220
Phe Cys Lys Ile Leu Phe Gln Asp Tyr His Ser Phe Val Thr His Gly
225                 230                 235                 240
Cys Thr Val Asp Asn Pro Val Leu Glu Arg Phe Ile Ser Leu Phe Asn
```

66

```
                    245                    250                    255
Ser Val Ser Gln Trp Val Gln Leu Met Ile Leu Ser Lys Pro Thr Ala
            260                    265                    270
Pro Gln Arg Ala Leu Val Ile Thr His Phe Val His Val Ala Glu Lys
            275                    280                    285
Leu Leu Gln Leu Gln Asn Phe Asn Thr Leu Met Ala Val Val Gly Gly
            290                    295                    300
Leu Ser His Ser Ser Ile Ser Arg Leu Lys Glu Thr His Ser His Val
305                    310                    315                    320
Ser Pro Glu Thr Ile Lys Leu Trp Glu Gly Leu Thr Glu Leu Val Thr
            325                    330                    335
Ala Thr Gly Asn Tyr Gly Asn Tyr Arg Arg Arg Leu Ala Ala Cys Val
            340                    345                    350
Gly Phe Arg Phe Pro Ile Leu Gly Val His Leu Lys Asp Leu Val Ala
            355                    360                    365
Leu Gln Leu Ala Leu Pro Asp Trp Leu Asp Pro Ala Arg Thr Arg Leu
            370                    375                    380
Asn Gly Ala Lys Met Lys Gln Leu Phe Ser Ile Leu Glu Glu Leu Ala
385                    390                    395                    400
Met Val Thr Ser Leu Arg Pro Pro Val Gln Ala Asn Pro Asp Leu Leu
            405                    410                    415
Ser Leu Leu Thr Val Ser Leu Asp Gln Tyr Gln Thr Glu Asp Glu Leu
            420                    425                    430
Tyr Gln Leu Ser Leu Gln Arg Glu Pro Arg Ser Lys Ser Ser Pro Thr
            435                    440                    445
Ser Pro Thr Ser Cys Thr Pro Pro Pro Arg Pro Pro Val Leu Glu Glu
            450                    455                    460
Trp Thr Ser Ala Ala Lys Pro Lys Leu Asp Gln Ala Leu Val Val Glu
465                    470                    475                    480
His Ile Glu Lys Met Val Glu Ser Val Phe Arg Asn Phe Asp Val Asp
            485                    490                    495
Gly Asp Gly His Ile Ser Gln Glu Glu Phe Gln Ile Ile Arg Gly Asn
            500                    505                    510
Phe Pro Tyr Leu Ser Ala Phe Gly Asp Leu Asp Gln Asn Gln Asp Gly
            515                    520                    525
Cys Ile Ser Arg Glu Glu Met Val Ser Tyr Phe Leu Arg Ser Ser Ser
            530                    535                    540
Val Leu Gly Gly Arg Met Gly Phe Val His Asn Phe Gln Glu Ser Asn
545                    550                    555                    560
Ser Leu Arg Pro Val Ala Cys Arg His Cys Lys Ala Leu Ile Leu Gly
            565                    570                    575
Ile Tyr Lys Gln Gly Leu Lys Cys Arg Ala Cys Gly Val Asn Cys His
            580                    585                    590
Lys Gln Cys Lys Asp Arg Leu Ser Val Glu Cys Arg Arg Arg Ala Gln
            595                    600                    605
Ser Val Ser Leu Glu Gly Ser Ala Pro Ser Pro Ser Pro Met His Ser
            610                    615                    620
His His His Arg Ala Phe Ser Phe Ser Leu Pro Arg Pro Gly Arg Arg
625                    630                    635                    640
Gly Ser Arg Pro Pro Glu Ile Arg Glu Glu Glu Val Gln Thr Val Glu
            645                    650                    655
Asp Gly Val Phe Asp Ile His Leu
            660
```

<210> 6
<211> 608

67

<212> PRT
<213> Mus musculus

<400> 6

```
Met Ala Ser Thr Leu Asp Leu Asp Lys Gly Cys Thr Val Glu Glu Leu
1               5                   10                  15
Leu Arg Gly Cys Ile Glu Ala Phe Asp Asp Ser Gly Lys Val Arg Asp
            20                  25                  30
Pro Gln Leu Val Arg Met Phe Leu Met Met His Pro Trp Tyr Ile Pro
        35                  40                  45
Ser Ser Gln Leu Ala Ser Lys Leu Leu His Phe Tyr Gln Gln Ser Arg
    50                  55                  60
Lys Asp Asn Ser Asn Ser Leu Gln Val Lys Thr Cys His Leu Val Arg
65                  70                  75                  80
Tyr Trp Val Ser Ala Phe Pro Ala Glu Phe Asp Leu Asn Pro Glu Leu
                85                  90                  95
Ala Glu Pro Ile Lys Glu Leu Lys Ala Leu Leu Asp Gln Glu Gly Asn
            100                 105                 110
Arg Arg His Ser Ser Leu Ile Asp Ile Glu Ser Val Pro Thr Tyr Lys
            115                 120                 125
Trp Lys Arg Gln Val Thr Gln Arg Asn Pro Val Glu Gln Lys Lys Arg
        130                 135                 140
Lys Met Ser Leu Leu Phe Asp His Leu Glu Pro Met Glu Leu Ala Glu
145                 150                 155                 160
His Leu Thr Tyr Leu Glu Tyr Arg Ser Phe Cys Lys Ile Leu Phe Gln
                165                 170                 175
Asp Tyr His Ser Phe Val Thr His Gly Cys Thr Val Asp Asn Pro Val
            180                 185                 190
Leu Glu Arg Phe Ile Ser Leu Phe Asn Ser Val Ser Gln Trp Val Gln
            195                 200                 205
Leu Met Ile Leu Ser Lys Pro Thr Ala Thr Gln Arg Ala Leu Val Ile
        210                 215                 220
Thr His Phe Val His Val Ala Glu Lys Leu Leu Gln Leu Gln Asn Phe
225                 230                 235                 240
Asn Thr Leu Met Ala Val Val Gly Gly Leu Ser His Ser Ser Ile Ser
                245                 250                 255
Arg Leu Lys Glu Thr His Ser His Val Ser Pro Asp Thr Ile Lys Leu
            260                 265                 270
Trp Glu Gly Leu Thr Glu Leu Val Thr Ala Thr Gly Asn Tyr Ser Asn
        275                 280                 285
Tyr Arg Arg Arg Leu Ala Ala Cys Val Gly Phe Arg Phe Pro Ile Leu
    290                 295                 300
Gly Val His Leu Lys Asp Leu Val Ala Leu Gln Leu Ala Leu Pro Asp
305                 310                 315                 320
Trp Leu Asp Pro Gly Arg Thr Arg Leu Asn Gly Ala Lys Met Arg Gln
                325                 330                 335
Leu Phe Ser Ile Leu Glu Glu Leu Ala Met Val Thr Ser Leu Arg Pro
            340                 345                 350
Pro Val Gln Ala Asn Pro Asp Leu Leu Ser Leu Leu Thr Val Ser Leu
        355                 360                 365
Asp Gln Tyr Gln Thr Glu Asp Glu Leu Tyr Gln Leu Ser Leu Gln Arg
    370                 375                 380
Glu Pro Arg Ser Lys Ser Ser Pro Thr Ser Pro Thr Ser Cys Thr Pro
385                 390                 395                 400
Pro Pro Arg Pro Pro Val Leu Glu Glu Trp Thr Ser Val Ala Lys Pro
                405                 410                 415
Lys Leu Asp Gln Ala Leu Val Ala Glu His Ile Glu Lys Met Val Glu
```

68

```
                 420                      425                      430
Ser Val Phe Arg Asn Phe Asp Val Asp Gly Asp Gly His Ile Ser Gln
         435                      440                      445
Glu Glu Phe Gln Ile Ile Arg Gly Asn Phe Pro Tyr Leu Ser Ala Phe
         450                      455                      460
Gly Asp Leu Asp Gln Asn Gln Asp Gly Cys Ile Ser Arg Glu Glu Met
465                      470                      475                      480
Ile Ser Tyr Phe Leu Arg Ser Ser Ser Val Leu Gly Gly Arg Met Gly
                 485                      490                      495
Phe Val His Asn Phe Gln Glu Ser Asn Ser Leu Arg Pro Val Ala Cys
                 500                      505                      510
Arg His Cys Lys Ala Leu Ile Leu Gly Ile Tyr Lys Gln Gly Leu Lys
         515                      520                      525
Cys Arg Ala Cys Gly Val Asn Cys His Lys Gln Cys Lys Asp Arg Leu
         530                      535                      540
Ser Val Glu Cys Arg Arg Arg Ala Gln Ser Val Ser Leu Glu Gly Ser
545                      550                      555                      560
Ala Pro Ser Pro Ser Pro Thr His Thr His His Arg Ala Phe Ser Phe
                 565                      570                      575
Ser Leu Pro Arg Pro Gly Arg Arg Ser Ser Arg Pro Pro Glu Ile Arg
         580                      585                      590
Glu Glu Glu Val Gln Thr Val Glu Asp Gly Val Phe Asp Ile His Leu
         595                      600                      605
```

<210> 7
<211> 591
<212> PRT
<213> Human

<400> 7
```
Gly Ser Ser Gly Leu Gly Lys Ala Ala Thr Leu Asp Glu Leu Leu Cys
1                 5                      10                       15
Thr Cys Ile Glu Met Phe Asp Asp Asn Gly Glu Leu Asp Asn Ser Tyr
         20                      25                       30
Leu Pro Arg Ile Val Leu Leu Met His Arg Trp Tyr Leu Ser Ser Thr
         35                      40                       45
Glu Leu Ala Glu Lys Leu Leu Cys Met Tyr Arg Asn Ala Thr Gly Glu
         50                      55                       60
Ser Cys Asn Glu Phe Arg Leu Lys Ile Cys Tyr Phe Met Arg Tyr Trp
65                      70                      75                       80
Ile Leu Lys Phe Pro Ala Glu Phe Asn Leu Asp Leu Gly Leu Ile Arg
                 85                      90                       95
Met Thr Glu Glu Phe Arg Glu Val Ala Ser Gln Leu Gly Tyr Glu Lys
                 100                     105                      110
His Val Ser Leu Ile Asp Ile Ser Ser Ile Pro Ser Tyr Asp Trp Met
         115                     120                      125
Arg Arg Val Thr Gln Arg Lys Lys Val Ser Lys Lys Gly Lys Ala Cys
         130                     135                      140
Leu Leu Phe Asp His Leu Glu Pro Ile Glu Leu Ala Glu His Leu Thr
145                     150                      155                      160
Phe Leu Glu His Lys Ser Phe Arg Arg Ile Ser Phe Thr Asp Tyr Gln
                 165                     170                      175
Ser Tyr Val Ile His Gly Cys Leu Glu Asn Asn Pro Thr Leu Glu Arg
                 180                     185                      190
Ser Ile Ala Leu Phe Asn Gly Ile Ser Lys Trp Val Gln Leu Met Val
                 195                     200                      205
```

```
Leu Ser Lys Pro Thr Pro Gln Gln Arg Ala Glu Val Ile Thr Lys Phe
    210                 215                 220
Ile Asn Val Ala Lys Lys Leu Leu Gln Leu Lys Asn Phe Asn Thr Leu
225             230                 235                 240
Met Ala Val Val Gly Gly Leu Ser His Ser Ser Ile Ser Arg Leu Lys
            245                 250                 255
Glu Thr His Ser His Leu Ser Ser Glu Val Thr Lys Asn Trp Asn Glu
            260                 265                 270
Met Thr Glu Leu Val Ser Ser Asn Gly Asn Tyr Cys Asn Tyr Arg Lys
    275                 280                 285
Ala Phe Ala Asp Cys Asp Gly Phe Lys Ile Pro Ile Leu Gly Val His
    290                 295                 300
Leu Lys Asp Leu Ile Ala Val His Val Ile Phe Pro Asp Trp Thr Glu
305                 310                 315                 320
Glu Asn Lys Val Asn Ile Val Lys Met His Gln Leu Ser Val Thr Leu
            325                 330                 335
Ser Glu Leu Val Ser Leu Gln Asn Ala Ser His His Leu Glu Pro Asn
            340                 345                 350
Met Asp Leu Ile Asn Leu Leu Thr Leu Ser Leu Asp Leu Tyr His Thr
    355                 360                 365
Glu Asp Asp Ile Tyr Lys Leu Ser Leu Val Leu Glu Pro Arg Asn Ser
    370                 375                 380
Lys Ser Pro Thr Ser Pro Thr Thr Pro Asn Lys Pro Val Val Pro Leu
385                 390                 395                 400
Glu Trp Ala Leu Gly Val Met Pro Lys Pro Asp Pro Thr Val Ile Asn
            405                 410                 415
Lys His Ile Arg Lys Leu Val Glu Ser Val Phe Arg Asn Tyr Asp His
            420                 425                 430
Asp His Asp Gly Tyr Ile Ser Gln Glu Asp Phe Glu Ser Ile Ala Ala
    435                 440                 445
Asn Phe Pro Phe Leu Asp Ser Phe Cys Val Leu Asp Lys Asp Gln Asp
    450                 455                 460
Gly Leu Ile Ser Lys Asp Glu Met Met Ala Tyr Phe Leu Arg Ala Lys
465                 470                 475                 480
Ser Gln Leu His Cys Lys Met Gly Pro Gly Phe Ile His Asn Phe Gln
            485                 490                 495
Glu Met Thr Tyr Leu Lys Pro Thr Phe Cys Glu His Cys Ala Gly Phe
            500                 505                 510
Leu Trp Gly Ile Ile Lys Gln Gly Tyr Lys Cys Lys Asp Cys Gly Ala
    515                 520                 525
Asn Cys His Lys Gln Cys Lys Asp Leu Leu Val Leu Ala Cys Arg Arg
    530                 535                 540
Phe Ala Arg Ala Pro Ser Leu Ser Ser Gly His Gly Ser Leu Pro Gly
545                 550                 555                 560
Ser Pro Ser Leu Pro Pro Ala Gln Asp Glu Val Phe Glu Phe Pro Gly
            565                 570                 575
Val Thr Ala Gly His Arg Asp Leu Asp Ser Arg Ala Ile Thr Leu
            580                 585                 590
```

<210> 8
<211> 581
<212> PRT
<213> Rattus norvegicus

<400> 8
Gly Ser Arg Ala Gly Pro Lys Gly Arg Leu Glu Ala Lys Ser Thr Asn

```
1               5                       10                      15
Ser Pro Leu Pro Ala Gln Pro Ser Leu Ala Gln Ile Thr Gln Phe Arg
        20                      25                      30
Met Met Val Ser Leu Gly His Leu Ala Lys Gly Ala Ser Leu Asp Asp
            35                      40                      45
Leu Ile Asp Ser Cys Ile Gln Ser Phe Asp Ala Asp Gly Asn Leu Cys
        50                      55                      60
Arg Ser Asn Gln Leu Leu Gln Val Met Leu Thr Met His Arg Ile Ile
65                      70                      75                      80
Ile Ser Ser Ala Glu Leu Leu Gln Lys Leu Met Asn Leu Tyr Lys Asp
                    85                      90                      95
Ala Leu Glu Lys Asn Ser Pro Gly Ile Cys Leu Lys Ile Cys Tyr Phe
                100                     105                     110
Val Arg Tyr Trp Ile Thr Glu Phe Trp Ile Met Phe Lys Met Asp Ala
                115                     120                     125
Ser Leu Thr Ser Thr Met Glu Glu Phe Gln Asp Leu Val Lys Ala Asn
            130                     135                     140
Gly Glu Glu Ser His Cys His Leu Ile Asp Thr Thr Gln Ile Asn Ser
145                     150                     155                     160
Arg Asp Trp Ser Arg Lys Leu Thr Gln Arg Ile Lys Ser Asn Thr Ser
                165                     170                     175
Lys Lys Arg Lys Val Ser Leu Leu Phe Asp His Leu Glu Pro Glu Glu
            180                     185                     190
Leu Ser Glu His Leu Thr Tyr Leu Glu Phe Lys Ser Phe Arg Arg Ile
            195                     200                     205
Ser Phe Ser Asp Tyr Gln Asn Tyr Leu Val Asn Ser Cys Val Lys Glu
        210                     215                     220
Asn Pro Thr Met Glu Arg Ser Ile Ala Leu Cys Asn Gly Ile Ser Gln
225                     230                     235                     240
Trp Val Gln Leu Met Val Leu Ser Arg Pro Thr Pro Gln Leu Arg Ala
                245                     250                     255
Glu Val Phe Ile Lys Phe Ile His Val Ala Gln Lys Leu His Gln Leu
                260                     265                     270
Gln Asn Phe Asn Thr Leu Met Ala Val Ile Gly Gly Leu Cys His Ser
            275                     280                     285
Ser Ile Ser Arg Leu Lys Glu Thr Ser Ser His Val Pro His Glu Ile
            290                     295                     300
Asn Lys Val Leu Gly Glu Met Thr Glu Leu Leu Ser Ser Cys Arg Asn
305                     310                     315                     320
Tyr Asp Asn Tyr Arg Arg Ala Tyr Gly Glu Cys Thr His Phe Lys Ile
                325                     330                     335
Pro Ile Leu Gly Val His Leu Lys Asp Leu Ile Ser Leu Tyr Glu Ala
            340                     345                     350
Met Pro Asp Tyr Leu Glu Asp Gly Lys Val Asn Val Gln Lys Leu Leu
            355                     360                     365
Ala Leu Tyr Asn His Ile Asn Glu Leu Val Gln Leu Gln Asp Val Ala
        370                     375                     380
Pro Pro Leu Asp Ala Asn Lys Asp Leu Val His Leu Leu Thr Leu Ser
385                     390                     395                     400
Leu Asp Leu Tyr Tyr Thr Glu Asp Glu Ile Tyr Glu Leu Ser Tyr Ala
                405                     410                     415
Arg Glu Pro Arg Asn His Arg Ala Pro Pro Leu Thr Pro Ser Lys Pro
            420                     425                     430
Pro Val Val Val Asp Trp Ala Ser Gly Val Ser Pro Lys Pro Asp Pro
        435                     440                     445
Lys Thr Ile Ser Lys His Val Gln Arg Met Val Asp Ser Val Phe Lys
        450                     455                     460
```

71

```
Asn Tyr Asp Leu Asp Gln Asp Gly Tyr Ile Ser Gln Glu Glu Phe Glu
465                 470             475                     480
Lys Ile Ala Ala Ser Phe Pro Phe Ser Phe Cys Val Met Asp Lys Asp
                485             490             495
Arg Glu Gly Leu Ile Ser Arg Asp Glu Ile Thr Ala Tyr Phe Met Arg
            500             505             510
Ala Ser Ser Ile Tyr Ser Lys Leu Gly Leu Gly Phe Pro His Asn Phe
        515             520             525
Gln Glu Thr Thr Tyr Leu Lys Pro Thr Phe Cys Asp Asn Cys Ala Gly
        530             535             540
Phe Leu Trp Gly Val Ile Lys Gln Gly Tyr Arg Cys Lys Asp Cys Gly
545             550             555                     560
Met Asn Cys His Lys Gln Cys Lys Asp Leu Val Val Phe Glu Cys Lys
                565             570             575
Lys Arg Ser Lys Ser
            580
```